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Document de Travail
Working Paper

Lemna

EA 4272

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2015/14

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Abstract: *This article aims to empirically investigate the determinants of bank credit by using a large data set covering 146 countries at different levels of economic development over the period 1990-2013. We find evidence of the country specific effect of economic growth on bank credit. Our empirical results also suggest that the health of domestic banking system plays a relevant role in boosting bank lending. By contrast, the dependence on foreign capital inflows of a country can make its domestic banking sector more vulnerable to external shock and then to face credit boom-bust cycles.*

Keywords: Bank credit; monetary policy; panel analysis

JEL Classification: E51; C23

[1] The author gratefully acknowledges financial support from the Chair Finance, Banque Populaire - Caisse d'Epargne, of the University of Nantes Research Foundation.

1. Introduction

As discussed in an orthodox survey (Levine, 2004), financial intermediaries can improve the (i) acquisition of information on firms, (ii) intensity with which creditors exert corporate control, (iii) provision of risk-reducing arrangements, (iv) pooling of capital, and (v) ease of making transactions. This argument favors a well-developed bank-based financial system. Mishkin (2007) also suggests that a better functioning bank credit system can alleviate the external financing constraints that impede credit expansion and the expansion of firms and industries.

In addition, several central banks especially consider the role of credit in the conduct of their monetary policy. For instance, in the European Central Bank (ECB)'s monetary policy strategy "given the particular importance of bank loans for the financing of euro area firms, developments in such loans may have important implications for euro area-wide economic activity" (ECB, 2004, p.20). The Federal Reserve also assigns an important role to credit as "policymakers continue to use monetary and credit data as a source of information about the state of the economy" (Bernanke, 2006, p.2). Moreover, Fernandez-Villaverde et al., 2013 argue that utilizing domestic credit instead of external financing allows a country to ease the pressure coming from the exchange rate risk on domestic firms.

On the other hand, as discussed in several studies (e.g. Mendoza and Terrones, 2008; Obstfeld and Rogoff, 2010), a rapid growth of domestic credit supply could play a significant role in predicting subsequent financial or economic crises, while a deep decline in domestic credit can result in a recession in economic activity and financial instability. According to Mishkin (2010), the recent global recession of 2007 also reflected one type of asset price bubble, which can be considered as a "credit-driven bubble".

Due to the crucial role of credit in economic activity of a country, there is a growing empirical literature examining the determinants of domestic credit, which may be demand-side or supply-side factors. Some studies consider both kinds of factors in the same model, while others try to distinguish them into two separate models. The determinants of credit supply have been also studied in the case of advanced, emergent as well as developing countries. Employing a cointegrating VAR for 16 industrialized countries, Hoffman (2001) finds evidence of a significant positive relation between domestic credit, real GDP and inflation, but a negative correlation between credit and real interest rates. Similarly, Calza et al. (2001), using VECM for a sample of European countries, show that in the long-run domestic credit is related positively to real GDP growth but negatively to short term and long term real interest rates. Focusing in a large panel of non-transition developing and industrialized countries Cotarelli et al. (2005) conclude that banking lending is positively related to GDP per capita, financial liberalization and transparency in

accounting standards but negatively depends on the public debt ratio. Differing from the above cited works, Aisen and Franken (2010) estimate the main determinants of bank credit growth during the 2008 financial crisis for a sample of over 80 countries. They find that larger bank credit booms prior to the crisis and lower GDP growth of trading partners are the most important determinants of the post-crisis bank credit slowdown. On the other hand, structural variables such as financial depth and integration level are also relevant. Guo and Stepanyan (2011) examine the changes in bank credit across a wide sample of 38 emerging economies during the last decade. Their main finding is that domestic and foreign funding contributes positively and symmetrically to credit growth. In another recent study of 24 emerging countries, Gozgor (2013) argues that the essential determinants of domestic credit are loose monetary policy in the domestic market, differences between domestic and global lending rates, and trade openness. On the other hand, external balance and perceptions of global tail risk negatively affect domestic credit levels.

Even though assessing the determinants of bank credit has been an interesting and growing subject in the empirical literature, the determinants of credit growth appear to be complex (Elekdag and Han, 2012). For this reason, we try to revisit and reexamine the possible determinants of domestic credit, which have been questioned in the literature. Domestic credit studied in this paper refers to the credit provided by the banking sector to non-financial private sector. Our study seeks to contribute to the related literature in several ways. First, following the existing literature, we will introduce all potential demand-side and supply-side factors in the estimated equation. In addition, we try to empirically model domestic credit level through two theoretical approaches, notably bank balance sheet and bank capital requirements. Second, the global financial crisis of 2007–2009 experienced the need for banking systems to be more liquid, more transparent, less leveraged and less prone to take on excessive risk. Since the recent financial crisis, banking system has been demanded to build larger buffers of high-quality capital and to reduce the riskiness of their portfolios. In this context, we aim to resolve the question of how banking system has adjusted its credit supply to higher capital requirements. Third, we extend our empirical analysis for a wide sample covering 146 countries at different levels of economic and financial development during the period of 1990-2013.

The reminder of this paper is organized as follows. Section 2 tries to formulize an empirical equation of domestic credit supply basing on the different theoretical approaches. Section 3 gives a descriptive analysis of the variables and the instruments used in the estimation. Section 4 summarizes the data and empirical methodology. Section 5 explains and discusses the empirical results. The concluding remarks and policy implications are in Section 6.

2. Empirical equation

The starting point is a primitive type of bank balance sheet in which the bank has no physical capital on its assets and no equity on its liabilities. This simple balance sheet is described as follows:

Assets	Liabilities
C: Credits	D: Deposits
R: Reserves	

The balance sheet can be represented as follows:

$$C + R = D \qquad \textbf{(1)}$$

From the above balance sheet and in developing a framework for the analysis of the banking firm, Baltensperger (1980) sets the objective function of the bank as a profit function:

$$\pi = r_C C - r_D D - l - s - c \quad \textbf{(2)}$$

Where r_C is the interest rate of bank credit, r_D is the interest paid on deposits, l is cost of illiquidity, s is cost due to default, and c is the real resource cost.

From Function (2), we can also generalize the function of credit supply as follows:

$$C = f(\pi; r_L;\ r_D; D; l; s; c) \qquad \textbf{(3)}$$

Now, we consider another type of bank balance sheet in which the bank has credits, reserves and treasury bills on its assets, and deposits and capital requirements on its liabilities. This balance sheet is written as follows:

Assets	Liabilities
C: Credits	D: Deposits
R: Reserves	K: Capital requirements
T: Treasury Bills (free-risk assets)	

In this case, the equation of balance sheet of a bank is presented as follows:

$$C + R + T = D + K \Leftrightarrow L = D + K - R - T \qquad \textbf{(4)}$$

Basing on this bank balance sheet approach, the determinants of bank credits supply are bank reserves, treasury bills, bank deposits and capital requirement. In general, credit supply positively depends on the credit rate of return. This positive relation is, nevertheless, influenced not only by other costs stemming from the bank's decision of credit supply but also by other components of balance sheet such as capital requirements and so on. We now study the most important determinants to show how they are handled in the model of credit supply.

Analysis of rates of return

A bank may allocate its resources either in credits or in government securities. The rates of return of a bank π include:

- Return in credits supply: $r_C - r_D$
- Return in T-bill investment: $r_T - r_D$ under the condition $r_C > r_T > r_D$

Considering that γ_1 is the bank resource allocation in credits and γ_2 is the bank resource allocation in T-bills with $0 < \gamma_1 + \gamma_2 < 1$, the function of bank rates of return is given as follows:

$$\pi = \gamma_1(r_C - r_D) + \gamma_2(r_T - r_D) = \gamma_1 r_C + \gamma_2 r_T - r_D(\gamma_1 + \gamma_2) \quad \textbf{(5)}$$

The credit supply C is expected to be positively related to its rate of return $(r_C - r_D)$, and negatively to π', which is the cost of controlling default risk. We assume that these relations are linear and given as follows:

$$C = \sum_{i=1}^{N} \gamma_{1i}(r_C - r_D)_i + \sum_{i=1}^{N} \pi'_i + \varepsilon \quad \textbf{(6)}$$

where ε is the vector containing other factors determining bank credit supply.

Analysis of capital requirements

The capital requirement ratio (CR) expresses the own funds K of a bank as a proportion of risk weighted assets and off-balance sheet items.

$$CR = \frac{Total\ own\ Funds\ (K)}{Risk\ weighted\ assets + Notional\ risk\ weighted\ Assets} \geq \alpha \quad \textbf{(7)}$$

where the risk weighted assets are the credit risk assets, and the notional risk weighted assets are the operational risk and market risk (R_N). The capital requirement ratio can be rewritten as follows:

$$CR = \frac{K}{w_1 C + w_2 T + R_N} \geq \alpha \quad \textbf{(8)}$$

Where w_1 is the weight for risky credits and and $w_2 = 0$ is the weight for government securities. It is assumed that:

$$\begin{cases} 0 \leq w_1 C \leq C \\ (w_1 C)_{max} = C\ if\ all\ accepted\ credits\ become\ risky\ credits \end{cases}$$

According to Formula (8), there is a minimum value b required for a bank Basel index, which is the ratio between capital and risk weighted assets. Moreover, the coefficient w_1 defined in regulation and known by the bank. Following Furfine (2001), we assume that the own capital of a bank approximates the minimum level stated by the requirement faces increasing costs. That means:

$$CR = \alpha \leftrightarrow C = \frac{K}{\alpha w_1} - \frac{R_N}{w_1} \quad \textbf{(9)}$$

Equation (8) means that credit supply positively relates to the own capital of a bank. On the other hand, it confirms a negative relationship between bank credits, operational and market risks and the Basel index. From Equations 2-6-9, we obtain the following reduced empirical form of bank credit supply:

$$C = \sum_{i=1}^{N} \gamma_{1i}(r_C - r_D)_i + \sum_{i=1}^{N} \pi'_i + \frac{K}{\alpha w_1} - \frac{R_N}{w_1} - (l + s + c) + \varepsilon \quad \textbf{(9)}$$

3. Data and variables description

This paper empirically examines the determinants of domestic credit levels across a wide range of countries at different levels of economic and financial development as long as data are available (*for the list of countries see Appendix A*). We exclude the transition economies and small economies with a population of less than 500 000 in 2000 from our analysis. The information on the transition economies and population size are from the World Bank Global Development Network Database (GDN) and the WDI, respectively. In addition, in order to avoid the potential problem of heterogeneity in cross-country economic development level, there are five data samples on which the estimation is based: (i) the whole sample; (ii) high-income sample (HI); (iii) low-income sample (LI); (iv) lower middle-income sample (LMI); and (v) upper middle-income sample (UMI). Our analysis employs annual data series from 1990 to 2013, which are collected from many international data sources: International Financial Statistics (IFS); Global Financial Development (GFD); Global Financial Development (GFD); and World Development Indicators (WDI). Due to data unavailability particularly in the case of developing countries, we miss data for some countries either at the start of the sample or at the end of sample. For this reason, our panel is not balanced.

With respect to the research objective, the dependent variable is the ratio of domestic credit provided by banking sector to private sector to GDP. The choice of explanatory variables is based on either the above reduced form of credit supply or the concerned literature. We explain and discuss the choice of independent variables as follows.

Internal demand factors

Following Equation 10, we first introduce the following independent variables in our estimation:

- *Deposit*: This variable is weighted by the share of total domestic deposit to GDP. This variable allows us to control for the important role of domestic deposits as a funding source.
- *Real interest rate*: This variable is measured by the lending interest rate adjusted for inflation as measured by the GDP deflator.
- *Banking management / operation costs*: This variable is weighted by total costs as a share of total income.
- *Capital requirement*: The ratio of capital requirement is initially provided by Barth et al. (2001). However, this data is only available for 2000, 2003, 2007 and 2013. For this reason, our analysis will use two alternative indicators. The first one is the share of bank regulatory capital to risk-weighted assets. The second one is the share of bank capital to bank assets

instead of the ratio of capital requirement. In fact, the evolution of this indicator can partially reflect the change in capital requirement ratio.

- *Systemic banking crisis*: We control for the impacts of systemic banking crisis on credit supply by introducing a dummy variable, which takes the value of 1 during the period of banking crisis and the value of 0 in other periods.

Second, we introduce other variables used in the literature to capture the impacts of internal demand factors on credit supply as follows:

- *Real GDP per capital in U.S. dollars*: This variable is a benchmark measure of the economy health and reflects the demand for credit (Frankel and Romer, 1999). We expect that higher domestic income corresponds to stronger domestic demand and higher domestic credit (Takats, 2010).
- *Inflation rate*: We introduce the inflation rate based on consumer price indices (2005 = 100) in the estimation as a control variable to verify the hypothesis of whether there is a connection between bank credit growth and price stability.
- *Domestic money supply*: This variable is defined as broad money M3 as a percentage of GDP, which is considered as a proxy for the overall monetary policy stance. As discussed in a seminal work, by using IS-LM framework Bernanke and Blinder (1988) analytically show that monetary policy could have a direct impact on bank lending: lower money supply leads to less domestic credit growth.

External supply factors

Together with internal demand factors, we also introduce in our estimation a broad set of external supply factors.

- *Nominal exchange rate*: As discussed in Borio et al. (2011), a fall in the value of nominal exchange rate of a country expresses an appreciation of the domestic currency and thus results in an increase in domestic credit.
- *Foreign capital flows*: This variable is measured by the share of net foreign direct investment and portfolio investment to GDP. Increasing private capital flows is expected to increase the volume of domestic credit (Lane and McQuade, 2013).
- *Financial integration level*: To capture the level of financial integration, we use the Chinn and Ito (2006) index of capital account openness (*KAOPEN*). The tested hypothesis is that higher financial integration level leads to higher inward capital flows, which in turn facilitate a country's financing.
- *Trade openness level:* this indicator is measured by exports plus imports over GDP. In fact, higher trade openness can relate to higher bank lending but also makes a country more

vulnerable to international shocks such as a dramatic collapse in global trade during the period 2008-2009.

Global factors

This study also aims at investigating the possible impacts of some global factors on bank credit supply by introducing in the estimation several explanatory variables as follows:

- *The change in U.S. money supply*: This variable is measured by the variations of the share of broad money to GDP and considered as a benchmark indicator of global liquidity variation.
- *The change in U.S. Federal funds rate*: This variable is used as another proxy for global liquidity variation. According to Csonto and Ivaschenko (2013), as lower Fed funds rate is assumed to be associated with higher liquidity, it is expected to have a positive impact on lending rate and thus to increase lending rates.
- *The difference between the domestic lending rate and the US (global) lending rate:* The question of interest is whether the domestic banks can borrow from abroad at lower global interest and lend at higher domestic interest rates.
- *External debt:* this variable is measured by the share of total external debt stocks to gross national income. An expected negative relationship between external debt and bank lending indicates that a country, with higher international liabilities, is more vulnerable to international shocks, which in turn limit access to new funding (Aisen and Franken, 2010).
- *Systemic banking crisis*: to control for the impact of any systemic banking crisis on domestic credit levels, we use a dummy variable that takes the value of 1 during the financial crisis period and of 0 in others periods.

Characteristics of the domestic banking system

Following Aisen and Fraken (2010), we assume that bank credit supply is also influenced by the characteristics of domestic banking system, which are captured by a set of following indicators:

- *Bank return on equity (ROE)* and *bank return on assets (ROA)*: These two indicators reflect the benefit of a bank. According to Aisen and Fraken (2010), a bank with sound profitability will most likely have great access to financing, but it could also indicate that banks have taken riskier positions.
- *Bank concentration*: This indicator is constructed by Beck et al. (2000) and defined as total assets of the three largest banks as a percentage of total assets of the banking system.
- *Initial development level of banking system*: to capture the impacts of initial level of banking system development, we simply use the ratio between the banking credit to private sector and GDP in 1989.

- *Bank non-performing loans to total gross loans*: This variable is to measure the soundness of banking system, which can strongly influence the growth of domestic credit.

The data sources of all key variables as well as their definition and units of measurement are summarized in Appendix B.

4. Empirical methodology

The present paper aims to explain the dynamics of bank credit supply across countries through an analysis of its potential determinants. Given this aim, we endeavor to make maximum use of both time and cross-country dimensions of available annual data sets. According to Baltagi (2005), using annual data for estimation purposes necessitates making an allowance for the possibility that the annual observations on independent variable may not represent long-run equilibrium values in any given year because of slow adjustment in explanatory variables. To allow for the possibility of partial adjustment, we determine a dynamic log-linear equation for domestic credit which includes its lagged dependent variable. Our empirical model is given as follows:

$$CRE_{it} = \beta_0 + \beta_1 CRE_{it-1} + \beta_2 INT_{it-1} + \beta_3 EXT_{it-1} + \beta_4 GLO_{it-1} + \beta_5 DOM_{it-1} + \delta_t + \varepsilon_{it} \qquad \textbf{(11)}$$

where CRE_{it} is the share of bank credit to private sectors in GDP of country i in year t, INT_{it} represents different internal demand factors, EXT_{it} represents a broad set of external supply factors, GLO_{it} indicates different global financial market conditions, DOM_{it} represents the characteristics of domestic banking system, ε_{it} is a disturbance term assumed to satify the Gauss-Markov conditions, and δ_t is a trend term accounting for a shift of the intercept over time. However, several econometric problems may arise from Equation 11.

- The independent variables are assumed to be endogenous. This is because causality may run in both directions – from independent variables to dependent variable and also these regressors may be correlated with the error term.
- Time-invariant individual characteristics (fixed effects) can be correlated with the explanatory variables.
- Introducing the lagged dependent variable gives rise to the autocorrelation between the regressors and the error term since lagged independent variable depends on the country specific effect. Due to this correlation, the estimation of Equation 11 suffers from the Nickell (1981) bias.

In this case, a transformation like first-differencing is again required to eliminate the individual effects from the transformed equations in order to obtain valid moment conditions. However, differencing introduces a simultaneous problem because lagged endogenous variables will be

correlated with the new differenced error term. In addition, heteroscedasticity is expected to be present because, in the panel data, heterogeneous errors might exist with different panel members. To resolve these problems, the GMM method developed by Arellano and Bond (1991) seems to produce more efficient and consistent estimators compared with other procedures. The GMM method also eliminates any endogeneity that may be due to the correlation of the country specific effects and the right hand side regressors. This technique treats all the variables other than the lagged dependent variable by assuming that they are uncorrelated with the error term ε_{it}. According to Baltagi (2005), in this case, we should lag all the right hand side regressors by one period, which makes this assumption more innocuous and is sufficient to prevent any bias in the estimated coefficients due to simultaneous common shocks to credit supply and the explanatory variables. If we first difference Equation 11, we get:

$$\Delta CRE_{it} = \beta_1 \Delta CRE_{it-1} + \beta_2 \Delta INT_{it-1} + \beta_3 \Delta EXT_{it-1} + \beta_4 \Delta GLO_{it-1} + \beta_5 \Delta DOM_{it-1} + \Delta \varepsilon_{it} \quad (\mathbf{12})$$

Equation 12 has removed the group effects and time trend. Arellano and Bond (1991) also develop the serial correlation test, in which the null hypothesis assumes no serial correlation in error term. The authors introduce the serial correlation test, often labelled "m1" for first-order and "m2" for second-order serial correlation. We expect to find first-order serial correlation in the first differenced residuals. The key problem arises if there is second or higher order serial correlation, as this would suggest that some of the moment conditions are invalid.

Before estimating the regression of interest, we report the means and standard-errors of dependent and independent key variables in Table 1. In addition, Table 1 provides the correlation coefficients between bank credit and all covariates. It can be seen that bank credit variable displays considerable variation both between and within countries, justifying the use of panel estimation techniques. As shown in Table 1, most of correlation coefficient are significant. This result aids the modelling and helps to confirm the choice of dependent variables. However, the values of correlation coefficient are diverse, ranging from negative to positive, from small to important. For instance, we find a negative and significant value of correlation coefficient between bank credit and bank operation costs, while that between bank credit and bank deposit is significantly positive. Looking at the external supply factors, bank credit is much less correlated to capital inflows than trade openness. The results on correlation coefficients show that the magnitudes, the statistical significance even the sign of correlation coefficient have been more or less altered. Thus, we should not be surprised to see different empirical results for different data samples.

5. Empirical analysis

This section reports the results of GMM estimator and robustness tests. It also outlines the results' implications for the considered theoretical hypotheses. On the other hand, the continuous and consistent financial data, in particular the data on capital requirement and characteristics of domestic banking system, are lacking. Therefore, to make maximum use of both time and cross-country dimensions of available annual data sets, we estimate four following alternative models:

- Model 1 includes all potential explanatory variables.
- Model 2 excludes bank operation costs and capital requirement.
- Model 3 excludes the characteristics of domestic banking system.
- Model 4 excludes bank operation costs, capital requirement, and also the characteristics of domestic banking system.

<*Insert Table 2*>

Table 2 reports the GMM results in two parts. The upper show the estimated coefficients and their robust standard errors for each model of interest. The lower presents the serial correlation test. According to the results, the first order serial correlations (m1) are expected because of first differencing, and the p-values obtained suggest no significant second order serial correlation (m2). Thus, we should reject the null hypothesis of the absence of first order serial correlation and not reject the absence of second order serial correlation. This result implies that our estimated models satisfy the required orthogonal conditions.[2]

Role of internal demand factors. Going straight to the hypothesis of interest, we note that the estimated coefficients of bank deposit enter in all models with a negative but statistically insignificant value. This means that there is no direct link between deposits and loans. In other words, if private sectors do not wish to borrow, no amount of money supply will encourage them to do so. This result does not support the classical loanable funds theory, according to which bank loans depend on pre-existent savings. By contrast, bank credit seems to positively depend on lending interest rate, when all estimated coefficients of this variable are positive and statistically significant. This is a quite important phenomenon implying that high lending rate may not necessarily translate into poor lending performance or lower proportion of commercial banks' funds available for lending respectively. Another potential determinant of bank credit is the share of operation costs in total income. In all regressions, the coefficients have the expected negative signs but statistically insignificant. Regarding the capital requirements, they all come out with the

[2] Together with the serial correlation test, another key test of the GMM estimator is the Sargan test to assess the model specification and over-identifying restrictions, whether the instruments, as a group, appear exogenous. This test is also known in the GMM context as Hansen's J test. However in this paper, the Sargan test's results are not reported since it is not possible to estimate the Sargan statistic with robust to heteroskedasticity standard errors.

expected negative signs and statistically significant. For instance, an increase in regulatory capital can reduce the supply of loans, meaning that there is a trade-off between solvency and loan supply. On the other hand, higher level of capital corresponds to more important credit supply.

We now turn our attention to other explanatory variables concerning economic activity. First, we find that economic growth captured by GDP per capita does not play any significant role in explaining bank lending. This result is not consistent with the hypothesis of a pro-cyclical relationship between economic growth and bank lending. For instance, Dell'Ariccia and Marquez (2006) suggest that bank credit expansions tend to be pro-cyclical, meaning that high economic growth tends to induce a high level bank credit supply. Precisely, during the period of economic boom, banks relax their criteria of selection and lend to both efficient and less efficient projects, while during the period of economic recession, bank credit dries up due to a high level of nonperforming loans and default risk. Second, we reveal an expected negative but insignificant relationship between inflation and bank lending. The negative impact of inflation on bank credit has been widely explained by the existing literature. For example, according to Huybens and Smith (1998, 1999), high inflation is detrimental to the development of the financial system when it limits the amount of external financing available to borrowers. Furthermore, Boyd et al. (2001) suggest that in high inflation environments, financial intermediaries are less willing to engage in long-run financial projects. Rousseau and Wachtel (2002, p.780) also argue that "high inflation will discourage any long term financial contracting and financial intermediaries will tend to maintain very liquid portfolios. In this inflationary environment intermediaries will be less eager to provide long-term financing for capital formation and growth." Third, we consider the liquidity effects on bank credit growth by using the monetary supply. In contrary to the insignificant effect of economic growth and inflation, the coefficients of monetary supply are highly statistically significant and have the expected positive sign. This means that monetary policy could have a direct impact on bank lending, which is so-called " bank credit channel" of monetary policy: an increase in liquidity allow banks to expand their supply of loans and thus making credit more available to bank-dependent borrowers (e.g. Bernanke and Blinder, 1992; Kashyap and Stein, 2000).

Role of external supply factors. First, we consider the exchange rate as one of relevant external supply factors influencing bank lending. As reported in Table 2, the estimated coefficients associated to the exchange rate variable are negative and strongly significant. This result supports the negative impact of exchange rate on credit supply, which can be explained in two ways. On the one hand, an increased value of domestic currency of a country can reduce its exports, which in turn negatively influences domestic bank credit. On the other hand, the devaluation of domestic currency of a country may also reflect a risky economic environment that worsens bank credit

supply. Second, we find that economic integration differently influences bank lending. The estimated coefficients of FDI flows enter in all models with the expected positive sign but statistically insignificant value. Accordingly, domestic bank credit does not depends on inward FDI. In other words, we can consider foreign investment as a funding source of domestic economic activities rather than a source of bank lending. Similarly, we do not find evidence that higher trade openness can contribute to bank credit. By contrast, when we control for the characteristics of domestic banking systems (Model 1-2), the KAOPEN index has negative and significant coefficients. This is because higher financial integration facilitates a country's financing, but it also makes it more vulnerable to international shocks. High vulnerability of banking systems can, in turn, reduce their credit supply.

Role of domestic banking system's characteristics. As mentioned above, the present paper also tends to revisit the impact of the characteristics of domestic banking system on bank credit growth. First, we find no evidence of an interaction between ROE/ROA and bank credit supply. This result does not support the hypothesis that banks with sound profitability have great access to financing. Second, the bank concentration variables have negative and significant estimated coefficients in all regressions, meaning that countries with a more concentrated banking industry displayed smaller growth rates of bank credit.[3] Lastly, as expected we reveal that an increase in non-performing loans can reduce credit supply of domestic banking system.

Role of global factors. We now turn our attention to the role of global factors in explaining bank credit growth. As showed in Table 2, they enter in all models with the expected signs but are mostly not statistically significant. The domestic and global lending rate difference is the sole exception. The coefficients of this variable are negative and statistically significant. This finding does not accord with Magud et al. (2012), who argue that the increasing interest rate spread between domestic and global markets would allow domestic banks to borrow at the lower global interest rate and to lend at the higher domestic interest rate. In other words, our empirical result reveals that the lower global interest rate cannot contribute to bank credit growth. In fact, the low global (U.S.) interest rate environment of recent years has been challenging for banks that rely on a wide spread between long- and short-maturity yields to generate earnings, and associated with decreased profitability for banks, particularly for small institutions not only in the U.S. but also in other banking systems. Therefore, even though the global interest rate is lower, bank credit supply dries up due to a decrease in bank profitability.

[3] Bank concentration in Beck et al. (2000) is defined as total assets of the three largest banks as a percentage of total assets of the banking system.

Robustness checks

On the whole, the impacts of potential determinants on explaining bank credit supply are diverse. They vary across countries at different levels of economic development, and also depend on the size of data sample. For this reason, the first robustness check is to re-examine all hypotheses of interest for different country groups in order to avoid the possible biased results due to the heterogeneity of economic development levels.

As stated above, basing on four different levels of economic development, we simply split the full data sample into four sub-samples: low-income (LI), lower middle-income (LMI), upper middle-income (UMI), and high-income (HI) countries. For each country sample, we also reuse the GMM technique with robust standard errors to re-estimate al models of interest. The empirical results are reported in Tables 3-6. Here, we only discuss the results complementing to and differencing from those for the full sample.

<*Insert Table 3-4*>

First, it is worth emphasizing that the empirical results of the LI and LMI samples provide only partial support to those of the full sample. We find that bank lending in LI countries positively depends on the global liquidity condition (measured by the U.S. money supply), while this relationship in LMI countries is negative. Furthermore, almost explanatory variables capturing the characteristics of domestic banking system (such as costs, capital, return, and concentration level) enter in all estimated models with insignificant coefficients or have the variant effects on credit supply. This is because the domestic banking systems in LI and LMI countries have not been enough developed and efficient. This less-development does not allow the domestic banking systems to determine themselves the volume of credit supply.

<*Insert Table 5*>

Second, compared to the LI and LMI samples, the results of UMI sample seem to be more consistent with those of the full sample. Meanwhile, there are still some different results. For instance, the coefficients of trade openness variables are positive and statistically significant. This means that the trade integration can alter credit growth in UMI countries. On the other hand, these countries have also experienced a falling trend in bank lending during the systemic banking crises.

<*Insert Table 6*>

Turning now to the HI sample, we first note that the empirical results strongly support those of the full sample. In addition, we find that the insignificant impact of economic growth in the full sample becomes statistically significant in HI countries. This means that the impact of economic growth on bank lending is country specific rather than general as earlier postulated. This result also allows us to consider the presence of potential threshold effect on the link between economic growth and credit supply.

In general, stressing the role of potential determinants in explaining credit supply in different data sub-samples allows us to avoid the potential heterogeneous problem of data. The empirical results for each data sub-sample are consistent with and complementary to those of the full sample, except the case of LI and LMI countries, in which we fail to determine the link between bank characteristics and bank lending. This exceptional finding can be explained by the fact that most of LI and LMI countries have experienced a less-developed domestic banking system.

<Insert Table 7>

Another problem with the original Arellano-Bond estimator is that lagged levels are often weak instruments for first differences, in particular for variables that are close to a random walk. So that, the second referred robustness check is the system-GMM estimator developed by Blundell and Bond (1998). As reported in Table 8, the system-GMM results are, by and large, similar to those of the GMM estimator in terms of sign and significance, but the magnitudes are different as would be expected.[4] In addition, the system-GMM results confirm the significant role of trade openness in fostering bank credit supply.

6. Concluding remarks

The present paper empirically revisits the determinants of domestic credit across a wide range of 146 countries at different levels of economic development over the period 1990-2013. Our empirical findings are generally insensitive to a range of datasets and estimation methods. We obtain several notable empirical findings. First, we reveal that bank credit is enhanced by a high level of lending interest rate, and domestic liquidity. Second, the empirical results indicate that credit supply is negatively related to capital requirement, exchange rate, KAOPEN index, bank concentration and non-performing loans. Third, we also find evidence of the country specific effect of economic growth on bank lending. Fourth, this paper offers a nuanced picture about the determinant role of several variables (such as inflation, global liquidity, ROE/ROA index and so on) on explaining bank credit growth.

Several policy implications can be drawn from our empirical findings. Above all, the country specific impact of economic growth as well as the insignificant impact of inflation do not allow considering them as conducive factors to credit growth. For this reason, policies, which foster economic growth and narrow inflation, might not be sufficient to boost credit growth. Second, The negative impact of KAOPEN index indicates that a banking sector, which is heavily dependent on foreign capital to finance domestic credit, could make a country more vulnerable to external shocks and could also be prone to boom-bust credit cycles. This is why macro-prudential policies should be particularly vigilant to the funding role of foreign capital inflows. Third, the health of

[4] Here, we only report the system-GMM estimator's results for the full sample to save space.

banking system, which is captured by non-performing loans, rather than the profitability of banking system, also plays a relevant role in strengthening credit growth.

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Appendix A: Country sample

Country sample	Countries
High income (44)	OECD countries (30): Australia; Austria; Belgium; Canada; Chile; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Ireland; Iceland; Israel; Italy; Japan; Korea, Rep.; Netherlands ; New Zealand; Norway; Poland; Portugal; Slovak Republic; Slovenia; Spain; Sweden; Switzerland; United Kingdom; United States Non-OECD countries (14): Bahrain; Croatia; Cyprus; Equatorial Guinea; Hong Kong SAR, China; Kuwait; Oman; Qatar; Russian Federation; Saudi Arabia; Singapore; Trinidad and Tobago; United Arab Emirates; Uruguay
Upper Middle income (36)	Albania; Algeria; Angola; Argentina; Azerbaijan; Belarus; Bosnia and Herzegovina; Botswana; Brazil; Bulgaria; China; Colombia; Costa Rica; Dominican Republic; Ecuador; Gabon; Hungary; Iran, Islamic Rep; Jamaica; Jordan; Latvia; Lebanon; Libya; Macedonia, FYR; Malaysia; Mauritius; Mexico; Namibia; Panama; Peru; Romania; Serbia; South Africa; Thailand; Tunisia; Turkey; Venezuela.
Lower Middle income (36)	Armenia; Bhutan; Bolivia; Capo Verde; Cameroon; Congo, Rep.; Cote d'Ivoire; Djibouti; Egypt, Arab Rep.; Georgia; Ghana; Guatemala; Guyana; Honduras; India; Indonesia; Kyrgyz R. ; Lao PDR; Lesotho; Mauritania; Moldova; Mongolia; Morocco; Nicaragua; Nigeria; Pakistan; Papua New Guinea; Paraguay; Philippines; Senegal; Sri Lanka; Swaziland; Turkmenistan; Ukraine; Vietnam; Yemen, Rep.; Zambia
Low income (30)	Bangladesh; Benin; Burkina Faso; Burundi; Cambodia; Central African Republic; Chad; Congo, Dem. Rep.; Eritrea; Ethiopia; Gambia; Guinea; Guinea-Bissau; Haiti; Kenya; Liberia; Madagascar; Malawi; Mali ; Mozambique ; Myanmar ; Nepal ; Niger ; Rwanda ; Sierra Leone; Tajikistan; Tanzania; Togo; Uganda; Zimbabwe

Appendix B: Data description

Variable	Source	Unit of measurement
Bank Credit to private sector	WDI; GFD	% of GDP
Internal demand factors		
Bank Deposit	WDI; GFD	% of GDP
Domestic real interest rate	WDI; IFS	%
Bank costs to total income	Beck et al. (2000)	%
Capital requirement	WDI; GFD	%
GDP per capita (at 2000 price)	WDI	U.S. dollars
Inflation rate	WDI	%
Domestic money supply	WDI	% of GDP
External supply factors		
Nominal exchange rate	WDI	LCU per US$
Capital flows (Stock FDI)	WDI	% of GDP
Financial integration	Chinn and Ito (2006)	KAOPEN index
Openness (Exports + Imports / GDP)	WDI	% GDP
Global factors		
US money supply	WDI	% of GDP
U.S. FED rate	WDI, IFS	%
Domestic & US (global) lending rates' gap	WDI, IFS	%
Systemic banking crisis dummy	Laeven and Valencia (2008; 2012)	0 / 1
External debt	WDI	% GNI
Characteristics of domestic banking system		
ROE	Beck et al. (2000)	%
ROA	Beck et al. (2000)	%
Bank concentration	Beck et al. (2000)	%
Bank non-performing loans to total gross loans	GFD	%
Initial level of Banking development	Beck et al. (2000)	% GDP

Table 1: Summary statistics and correlation coefficients: Full simple

Variable	Mean	Standard Deviation			Min	Max	Cor. coef
		Overall	Between	Within			
Bank credit	3.277	1.050	0.959	0.438	-1.869	5.767	1.000
Bank deposit	3.383	0.873	0.827	0.310	-1.682	5.713	0.860*
Domestic real interest rate	4.645	0.253	0.107	0.229	-0.958	6.509	0.019
Costs/Income	4.004	0.323	0.275	0.208	0.426	5.422	-0.078*
Bank capital/Assets	2.167	0.425	0.384	0.185	0.405	3.421	-0.556*
Bank regulatory capital/Risk-weighted assets	2.705	0.303	0.288	0.170	0.916	3.884	-0.440*
GDP per capita	7.896	1.668	1.654	0.246	3.913	11.124	0.708*
Inflation rate	3.776	0.500	0.277	0.417	-1.224	10.104	-0.290*
Domestic money supply	3.673	0.706	0.648	0.290	0.481	5.817	0.837*
Nominal exchange rate	3.228	2.996	2.689	1.305	-19.850	22.629	-0.272*
FDI flows	4.461	0.136	0.040	0.130	-2.227	5.501	0.036*
KAOPEN	0.338	1.581	1.382	0.768	-1.875	2.422	0.496*
Trade openness level	4.265	0.590	0.579	0.219	-1.175	6.276	0.229*
U.S money supply	4.271	0.121	0.000	0.121	4.086	4.504	0.192*
U.S. FED rate	0.632	1.439	0.000	1.439	-2.303	2.092	-0.162*
Lending rates' gap	3.374	0.441	0.321	0.302	2.128	8.473	-0.452*
External debt	3.791	0.934	0.783	0.564	0.213	7.231	-0.295*
ROE	5.725	0.148	0.043	0.141	-0.600	6.125	-0.072*
ROA	4.709	0.119	0.032	0.114	-0.674	4.876	-0.069*
Bank concentration	4.215	0.309	0.270	0.156	3.063	4.605	-0.138*
Bank non-performing loans /total gross loans	1.529	1.045	0.834	0.645	-1.609	4.305	-0.385*

*Note: * indicates statistical significance at least the 10% level.*

Table 2: GMM estimator's results for Full sample

Independent Variables	Model 1	Model 2	Model 3	Model 4
Lagged bank credit	0.698*** (0.054)	0.734*** (0.042)	0.685*** (0.053)	0.598*** (0.060)
Internal demand factors				
Bank deposit	-0.020 (0.115)	-0.036 (0.083)	-0.078 (0.107)	-0.054 (0.074)
Real interest rate	0.707*** (0.090)	0.838*** (0.075)	0.754*** (0.084)	0.377*** (0.100)
Costs/Income	-0.023 (0.032)	-	-0.003 (0.037)	-
Bank capital/Assets	0.102** (0.040)	-	0.099** (0.034)	-
Regulatory capital	-0.112** (0.046)	-	-0.134*** (0.037)	-
GDP per capita	-0.019 (0.106)	-0.041 (0.118)	0.134 (0.122)	0.009 (0.087)
Inflation rate	-0.091 (0.053)	0.087 (0.057)	-0.119 (0.062)	-0.007 (0.050)
Money supply	0.441*** (0.126)	0.450*** (0.100)	0.487*** (0.104)	0.562*** (0.090)
External supply factors				
Exchange rate	-0.170*** (0.057)	-0.159*** (0.041)	-0.117** (0.056)	-0.073** (0.032)
FDI flows	0.050 (0.096)	0.028 (0.078)	0.110 (0.093)	0.048 (0.121)
KAOPEN	-0.026** (0.011)	-0.023** (0.011)	-0.010 (0.011)	0.001 (0.018)
Trade openness level	0.040 (0.059)	0.002 (0.049)	0.002 (0.060)	0.022 (0.064)
Global factors				
U.S money supply	0.131 (0.080)	0.112 (0.093)	0.009 (0.102)	0.023 (0.121)
U.S. FED rate	0.005 (0.005)	0.007 (0.005)	0.001 (0.004)	0.006 (0.005)
Lending rates' gap	-0.231*** (0.062)	-0.199** (0.048)	-0.281*** (0.055)	-0.244*** (0.072)
External debt	-0.021 (0.033)	-0.027 (0.031)	-0.024 (0.030)	-0.008 (0.026)
Crisis	-0.035 (0.034)	-0.018 (0.027)	-0.029 (0.029)	-0.009 (0.025)
Characteristics of domestic banking system				
ROE	-0.105 (0.127)	0.013 (0.011)	-	-
ROA	-0.095 (0.301)	-0.680 (0.419)	-	-
Bank concentration	-0.150*** (0.041)	-0.119*** (0.039)	-	-
Non-performing loans	-0.037*** (0.011)	-0.048*** (0.011)	-	-
Constant	-1.955 (2.006)	-0.572 (2.172)	-4.490*** (0.911)	-1.480 (1.034)
Serial Corr. (m1)	-4.672 [0.000]	-5.279 [0.000]	-3.782 [0.000]	-4.656 [0.000]
Serial Corr. (m2)	-1.540 [0.123]	-2.607 [0.009]	-0.814 [0.416]	0.858 [0.391]

*Note: Values in parentheses are robust standard errors. Values in brackets are P-values. *** (**; *): Significant at 1%, 5% and 10% level respectively.*

Table 3: GMM estimator's results for Low income sample

Independent Variables	Model 1	Model 2	Model 3	Model 4
Lagged bank credit	0.015 (0.060)	0.482***(0.067)	0.200** (0.089)	0.575** (0.066)
Internal demand factors				
Bank deposit	-0.069 (0.165)	0.022(0.195)	0.131 (0.267)	-0.034 (0.121)
Real interest rate	0.576***(0.142)	0.427***(0.206)	0.692** (0.268)	0.303*** (0.074)
Costs/Income	0.100 (0.097)	-	0.114 (0.097)	-
Bank capital/Assets	0.384***(0.075)	-	0.272*** (0.069)	-
Regulatory capital	-0.304***(0.050)	-	-0.249*** (0.068)	-
GDP per capita	0.601 (0.332)	-0.379 (0.350)	-0.260 (0.177)	-0.079 (0.223)
Inflation rate	-0.205 (0.120)	-0.025 (0.029)	-0.065 (0.092)	-0.093 (0.081)
Money supply	0.819***(0.133)	0.530***(0.170)	0.689*** (0.208)	0.529*** (0.118)
External supply factors				
Exchange rate	-0.490**(0.215)	0.032(0.156)	0.023(0.278)	-0.046 (0.038)
FDI flows	0.252 (0.158)	-0.326*** (0.095)	-0.145 (0.227)	-0.052 (0.214)
KAOPEN	-0.067**(0.027)	-0.001(0.025)	0.034(0.021)	-0.009 (0.030)
Trade openness level	0.338**(0.153)	0.020(0.058)	-0.060 (0.129)	0.073 (0.111)
Global factors				
U.S money supply	0.187***(0.087)	1.362**(0.536)	0.944**(0.353)	0.306*** (0.090)
U.S. FED rate	-0.115**(0.032)	-0.005 (0.012)	-0.061(0.045)	-0.015 (0.011)
Lending rates' gap	-1.145*** (0.159)	-0.597***(0.184)	-0.828**(0.392)	-0.420*** (0.136)
External debt	0.071(0.076)	0.031(0.078)	-0.045 (0.035)	0.021 (0.032)
Crisis	-	-	-	-0.064 (0.054)
Characteristics of domestic banking system				
ROE	-0.122 (0.118)	-0.189 (0.286)	-	-
ROA	-1.567 (1.407)	-1.096 (1.099)	-	-
Bank concentration	0.143 (0.230)	-0.298** (0.131)	-	-
Nonperforming loans	-0.164*** (0.030)	-0.031 (0.038)	-	-
Constant	-49.646*** (7.488)	3.864 (4.309)	-4.513 (4.973)	-0.906 (1.494)
Serial Corr. (m1)	-1.748 [0.080]	-1.624 [0.100]	-1.736 [0.082]	-2.777 [0.006]
Serial Corr. (m2)	1.634 [0.102]	0.185 [0.853]	1.552 [0.121]	1.220 [0.222]

*Note: Values in parentheses are robust standard errors. Values in brackets are P-values. *** (**; *): Significant at 1%, 5% and 10% level respectively.*

Table 4: GMM estimator's results for Lower middle income sample

Independent Variables	Model 1	Model 2	Model 3	Model 4
Lagged bank credit	0.752*** (0.053)	0.831*** (0.029)	0.791*** (0.048)	0.598*** (0.064)
Internal demand factors				
Bank deposit	-0.303 (0.176)	-0.293** (0.111)	-0.188 (0.131)	-0.147 (0.133)
Real interest rate	0.506 (0.300)	0.782*** (0.126)	0.629*** (0.160)	0.314* (0.181)
Costs/Income	-0.020 (0.102)	-	0.074 (0.081)	-
Bank capital/Assets	0.185 (0.133)	-	0.200** (0.073)	-
Regulatory capital	-0.176 (0.102)	-	-0.146** (0.057)	-
GDP per capita	0.176 (0.114)	0.063 (0.126)	0.093 (0.134)	0.027 (0.149)
Inflation rate	-0.147 (0.109)	-0.141 (0.099)	-0.105 (0.087)	-0.006 (0.082)
Money supply	0.842*** (0.117)	0.657*** (0.110)	0.716*** (0.095)	0.618*** (0.134)
External supply factors				
Exchange rate	-0.218** (0.096)	-0.275*** (0.085)	-0.295** (0.098)	-0.183*** (0.060)
FDI flows	0.106 (0.329)	0.067 (0.324)	0.203 (0.347)	-0.029 (0.264)
KAOPEN	-0.024* (0.012)	-0.028* (0.016)	0.023 (0.022)	0.035 (0.026)
Trade openness level	-0.085 (0.060)	-0.063 (0.057)	-0.001 (0.082)	-0.022 (0.093)
Global factors				
U.S money supply	-0.357* (0.176)	-0.389** (0.164)	-0.415** (0.153)	0.188 (0.264)
U.S. FED rate	0.005 (0.008)	-0.009 (0.008)	0.001 (0.007)	0.002 (0.008)
Lending rates' gap	-0.133 (0.115)	-0.215*** (0.059)	-0.060 (0.087)	-0.378*** (0.093)
External debt	-0.059 (0.051)	0.014 (0.070)	-0.110** (0.049)	0.040 (0.048)
Crisis	-0.060 (0.058)	-0.079** (0.025)	-0.021 (0.039)	-0.001 (0.045)
Characteristics of domestic banking system				
ROE	-0.583 (0.582)	0.155*** (0.018)	-	-
ROA	-0.965 (1.461)	-0.432 (0.709)	-	-
Bank concentration	-0.093 (0.057)	-0.037 (0.059)	-	-
Non-performing loans	-0.013 (0.015)	-0.054*** (0.016)	-	-
Constant	5.563 (5.896)	-1.076 (4.081)	-3.359* (1.891)	-0.838 (1.228)
Serial Corr. (m1)	-2.945 [0.003]	-3.215 [0.001]	-3.275 [0.001]	-2.958 [0.003]
Serial Corr. (m2)	0.399 [0.689]	-1.382 [0.167]	0.305 [0.760]	0.949 [0.342]

*Note: Values in parentheses are robust standard errors. Values in brackets are P-values. *** (**; *): Significant at 1%, 5% and 10% level respectively.*

Table 5: GMM estimator's results for Upper middle income sample

Independent Variables	Model 1	Model 2	Model 3	Model 4
Lagged bank credit	0.763*** (0.045)	0.764*** (0.050)	0.734*** (0.044)	0.720*** (0.054)
Internal demand factors				
Bank deposit	0.042 (0.067)	-0.035 (0.055)	0.152 (0.098)	-0.247* (0.109)
Real interest rate	0.501*** (0.117)	0.639*** (0.108	0.538*** (0.089)	0.396*** (0.128)
Costs/Income	0.017 (0.068)	-	0.094 (0.061)	-
Bank capital/Assets	0.103** (0.049)	-	0.127** (0.058)	-
Regulatory capital	-0.104** (0.044)	-	-0.087** (0.037)	-
GDP per capita	0.075 (0.088)	-0.036 (0.115)	0.191 (0.143)	0.237** (0.109)
Inflation rate	-0.017 (0.056)	-0.074 (0.052)	-0.062 (0.066)	-0.036 (0.096)
Money supply	0.195* (0.099)	0.260** (0.113)	0.151* (0.095)	0.520*** (0.145)
External supply factors				
Exchange rate	-0.151*** (0.047)	-0.148*** (0.040)	-0.074 (0.053)	-0.060 (0.042)
FDI flows	-0.027 (0.076)	-0.091 (0.076)	0.053 (0.087)	-0.086 (0.119)
KAOPEN	-0.019** (0.009)	-0.003** (0.001)	-0.007 (0.011)	0.007 (0.021)
Trade openness level	0.082** (0.040)	0.073** (0.033)	0.033* (0.017)	0.057 (0.128)
Global factors				
U.S money supply	0.046 (0.101)	0.174 (0.109)	-0.063 (0.103)	-0.184 (0.117)
U.S. FED rate	0.001 (0.006)	0.002 (0.007)	0.000 (0.008)	0.006 (0.009)
Lending rates' gap	-0.229*** (0.071)	-0.228*** (0.062)	-0.330*** (0.060)	-0.216** (0.100)
External debt	0.048 (0.038)	0.081** (0.032)	-0.003 (0.031)	0.073 (0.052)
Crisis	-0.049** (0.019)	-0.091** (0.037)	-0.070** (0.034)	-0.074** (0.031)
Characteristics of domestic banking system				
ROE	0.256 (0.225)	0.184 (0.229)	-	-
ROA	0.503 (0.430)	0.154 (0.400)	-	-
Bank concentration	-0.090** (0.042)	-0.058* (0.030)	-	-
Nonperforming loans	-0.060*** (0.008)	-0.068*** (0.011)	-	-
Constant	3.548 (2.808)	2.094 (1.695)	-3.390** (1.269)	-1.705 (1.660)
Serial Corr. (m1)	-3.350 [0.001]	-3.396 [0.001]	-2.935 [0.003]	-3.250 [0.001]
Serial Corr. (m2)	-0.696 [0.486]	-0.969 [0.332]	-0.420 [0.674]	0.192 [0.847]

*Note: Values in parentheses are robust standard errors. Values in brackets are P-values. *** (**; *): Significant at 1%, 5% and 10% level respectively.*

Table 6: GMM estimator's results for High-income sample

Independent Variables	Model 1	Model 2	Model 3	Model 4
Lagged bank credit	0.452*** (0.075)	0.435*** (0.067)	0.515*** (0.048)	0.714*** (0.048)
Internal demand factors				
Bank deposit	0.012 (0.177)	-0.052 (0.132)	-0.182 (0.117)	-0.528***(0.170)
Real interest rate	1.579*** (0.476)	1.202** (0.404)	1.299*** (0.285)	0.899* (0.489)
Costs/Income	-0.090 (0.072)	-	-0.059 (0.036)	-
Bank capital/Assets	0.072** (0.033)	-	0.077** (0.035)	-
Regulatory capital	-0.160* (0.083)	-	-0.074** (0.034)	-
GDP per capita	0.559***(0.162)	0.493** (0.234)	0.278* (0.147)	0.303*** (0.132)
Inflation rate	-0.126 (0.172)	-0.018 (0.214)	-0.053 (0.177)	-0.097 (0.225)
Money supply	0.413** (0.175)	0.444** (0.159)	0.527*** (0.158)	0.437** (0.200)
External supply factors				
Exchange rate	-0.053** (0.023)	-0.090** (0.033)	-0.063* (0.033)	-0.023** (0.011)
FDI flows	-0.256 (0.191)	-0.368** (0.151)	-0.242* (0.131)	1.020 (0.754)
KAOPEN	-0.119***(0.028)	-0.091*** (0.022)	-0.013 (0.014)	0.001 (0.031)
Trade openness level	0.311***(0.088)	0.260*** (0.061)	0.206*** (0.055)	0.210* (0.116)
Global factors				
U.S money supply	0.308 (0.170)	0.250 (0.158)	0.046 (0.169)	0.206 (0.248)
U.S. FED rate	0.018** (0.009)	0.026** (0.010)	0.017* (0.010)	-0.005 (0.023)
Lending rates' gap	-0.191** (0.094)	-0.167* (0.091)	-0.249** (0.111)	-0.135 (0.136)
External debt	-0.082*** (0.019)	-0.074*** (0.021)	-0.073*** (0.020)	0.008 (0.024)
Crisis	-0.024 (0.015)	-0.004 (0.015)	0.034 (0.028)	-0.015 (0.015)
Characteristics of domestic banking system				
ROE	0.503 (0.430)	0.251 (0.189)	-	-
ROA	0.569 (0.521)	0.333 (0.200)	-	-
Bank concentration	-0.151* (0.076)	-0.166** (0.078)	-	-
Non-performing loans	-0.014** (0.006)	0.018** (0.007)	-	-
Constant	-16.336*** (4.026)	-9.923*** (3.082)	-5.630*** (1.976)	-10.132** (4.978)
Serial Corr. (m1)	-1.904 [0.056]	-1.949 [0.051]	-1.981 [0.047]	-1.487 [0.136]
Serial Corr. (m2)	-0.371 [0.710]	-0.722 [0.470]	-1.854 [0.063]	-0.636 [0.524]

*Note: Values in parentheses are robust standard errors. Values in brackets are P-values. *** (**; *): Significant at 1%, 5% and 10% level respectively.*

Table 7: System-GMM estimator's results for Full sample

Independent Variables	Model 1	Model 2	Model 3	Model 4
Lagged bank credit	0.796*** (0.056)	0.857*** (0.043)	0.787*** (0.052)	0.697*** (0.051)
Internal demand factors				
Bank deposit	-0.143 (0.115)	-0.113 (0.101)	-0.118 (0.105)	-0.080 (0.071)
Real interest rate	0.674*** (0.123)	0.808*** (0.094)	0.759*** (0.094)	0.297** (0.107)
Costs/Income	-0.036 (0.044)	-	-0.071 (0.042)	-
Bank capital/Assets	0.114** (0.049)	-	0.120** (0.041)	-
Regulatory capital	-0.083* (0.049)	-	-0.129*** (0.042)	-
GDP per capita	-0.052 (0.061)	-0.034 (0.056)	0.026 (0.039)	-0.103 (0.055)
Inflation rate	-0.074 (0.064)	-0.093 (0.057)	-0.044 (0.061)	-0.096 (0.060)
Money supply	0.424*** (0.112)	0.438*** (0.095)	0.457*** (0.091)	0.531*** (0.082)
External supply factors				
Exchange rate	-0.056** (0.026)	-0.052** (0.024)	-0.017** (0.018)	-0.054** (0.021)
FDI flows	0.077 (0.126)	0.001 (0.104)	0.359** (0.147)	0.198 (0.139)
KAOPEN	-0.026* (0.014)	-0.034** (0.013)	-0.017 (0.013)	0.001 (0.013)
Trade openness level	0.150** (0.064)	0.092* (0.047)	0.161** (0.066)	0.120** (0.060)
Global factors				
U.S money supply	0.357*** (0.102)	0.376*** (0.104)	0.365*** (0.109)	0.198 (0.113)
U.S. FED rate	0.011 (0.007)	0.015** (0.006)	0.006 (0.007)	0.009 (0.006)
Lending rates' gap	-0.201** (0.069)	-0.158** (0.054)	-0.242*** (0.070)	-0.253*** (0.072)
External debt	-0.023 (0.033)	-0.032 (0.034)	-0.044 (0.026)	-0.038 (0.021)
Crisis	-0.061 (0.040)	-0.030 (0.024)	-0.049 (0.029)	-0.016 (0.030)
Characteristics of domestic banking system				
ROE	0.221 (0.161)	0.128*** (0.013)	-	-
ROA	0.008 (0.286)	0.721 (0.465)	-	-
Bank concentration	-0.170*** (0.043)	-0.145** (0.051)	-	-
Non-performing loans	-0.055*** (0.016)	-0.061*** (0.015)	-	-
Constant	-2.531 (2.044)	-1.770 (2.679)	-6.190*** (0.959)	-1.708 (1.088)
Serial Corr. (m1)	-4.545 [0.000]	-5.172 [0.000]	-3.668 [0.000]	-4.953 [0.000]
Serial Corr. (m2)	-1.495 [0.134]	-2.095 [0.036]	-1.126 [0.260]	1.003 [0.315]

*Note: Values in parentheses are robust standard errors. Values in brackets are P-values. *** (**; *): Significant at 1%, 5% and 10% level respectively.*